

# Safety Data Sheet

According to Japanese National Standard JIS Z 7252:2019, JIS Z 7253:2019 and the GHS Revision 6

Initial preparation date: 03.25.2024

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## Durable V2/V2.1 Resin

### SECTION 1: Chemical product and company identification

#### Product identifier

**Product name:** Durable V2/V2.1 Resin

**Product code:** FLDUCL02; FLDUCL21

#### Recommended use of the product and restriction on use

**Relevant identified uses:** For use in Formlabs SLA Printers

**Uses advised against:** Not determined or not applicable.

**Reasons why uses advised against:** Not determined or not applicable.

#### Manufacturer or supplier details

**Manufacturer:**

**United States**

Formlabs, Inc

35 Medford St

Suite 201 Somerville, MA 02143

+1 617 855 0762

sds@formlabs.com

#### Emergency telephone number:

**APAC**

CHEMTREC (APAC)

+65 3163 8374 (24/7)

### SECTION 2: Hazards identification

#### Classification in accordance with JIS Z 7252:2019 and the GHS Revision 6:

Skin irritation, category 2

Eye irritation, category 2A

Skin sensitization, category 1

Specific target organ toxicity - single exposure, category 3, respiratory tract irritation

Chronic aquatic hazard, category 2

#### Label elements

##### Hazard pictograms:



**Signal Word:** Warning

#### Hazard statements:

H315 Causes skin irritation

H317 May cause an allergic skin reaction

H319 Causes serious eye irritation

H335 May cause respiratory irritation

H411 Toxic to aquatic life with long lasting effects

#### Precautionary statements:

P261 Avoid breathing dust/fume/gas/mist/vapours/spray

P264 Wash skin thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area

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P272 Contaminated work clothing should not be allowed out of the workplace  
P273 Avoid release to the environment  
P280 Wear protective gloves, protective clothing and eye protection.  
P302+P352 IF ON SKIN: Wash with plenty of water and soap.  
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P312 Call a POISON CENTER or physician if you feel unwell..  
P332+P313 If skin irritation occurs: Get medical advice/attention  
P333+P313 If skin irritation or rash occurs: Get medical advice/attention  
P337+P313 If eye irritation persists: Get medical advice/attention.  
P362 Take off contaminated clothing  
P363 Wash contaminated clothing before reuse  
P391 Collect spillage  
P403+P233 Store in a well-ventilated place. Keep container tightly closed  
P405 Store locked up  
P501 Dispose of contents and container in accordance with local, regional, national, and international regulations.

**Hazards not otherwise classified:** None

### SECTION 3: Composition/information on ingredients

**Substance:** Not applicable

**Mixture:**

Identification	Name	Wt. %
CAS number: 72869-86-4	Urethane dimethacrylate	45-65
CAS number: Trade Secret	Methacrylate Monomer(s)	15-25
CAS number: Trade Secret	Acrylate Monomer(s)	10-20
CAS number: Trade Secret	Photoinitiators	<1.5

**Additional information:** None

### SECTION 4: First-aid measures

#### Description of first aid measures

##### General notes:

Show this Safety Data Sheet to the doctor in attendance.

##### After inhalation:

If inhaled, remove person to fresh air and place in a position comfortable for breathing. If respiratory symptoms develop or persist, seek medical advice/attention.

##### After skin contact:

Wash affected area with plenty of soap and water. Remove contaminated clothing and laundry before reuse. If skin irritation develops or persists, seek medical advice/attention.

##### After eye contact:

Immediately rinse eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for

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and remove any contact lenses. Continue to rinse for at least 15 minutes. If eye irritation develops or persists, seek medical advice/attention.

#### After swallowing:

If swallowed, DO NOT induce vomiting unless told to do so by a physician or poison control center. Rinse mouth with water. Never give anything by mouth to an unconscious person. If spontaneous vomiting occurs, place on the left side with head down to prevent aspiration of liquid into the lungs. If symptoms develop or persist, seek medical advice/attention.

#### Most important symptoms and effects, both acute and delayed

##### Acute symptoms and effects:

Skin contact may result in redness, pain, burning and inflammation.

Eye contact may result in irritation, redness, pain, inflammation, itching, burning and tearing.

Dermal exposure may cause an allergic skin reaction. Symptoms may include irritation, redness, pain, rash, inflammation, itching, burning and dermatitis.

Inhalation may have adverse effects on the respiratory tract. Symptoms may include cough, breathing difficulties, sore throat and inflammation of the mucous membrane lining the respiratory tract.

##### Delayed symptoms and effects:

Effects are dependent on exposure (dose, concentration, contact time).

#### Immediate medical attention and special treatment

##### Specific treatment:

If respiratory symptoms persist, seek medical attention.

##### Notes for the doctor:

Treat symptomatically.

### SECTION 5: Fire-fighting measures

#### Extinguishing media

##### Suitable extinguishing media:

Water mist/fog, carbon dioxide, dry chemical or alcohol resistant foam.

##### Unsuitable extinguishing media:

Do not use water jet.

#### Specific hazards during fire-fighting:

Thermal decomposition may produce irritating/toxic fumes/gases.

#### Special protective equipment for firefighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA).

#### Special precautions:

Avoid contact with skin, eyes, hair and clothing. Do not breathe fumes/gas/mists/aerosols/vapors/dusts.

Move containers from fire area if safe to do so. Use water spray/fog for cooling fire exposed containers.

Avoid unnecessary run-off of extinguishing media which may cause pollution.

### SECTION 6: Accidental release measures

#### Personal precautions, protective equipment and emergency procedures:

Evacuate unnecessary personnel. Ventilate area. Extinguish any sources of ignition. Wear recommended personal protective equipment (see Section 8). Avoid contact with skin, eyes and clothing. Avoid breathing mist, vapor, dust, fume and spray. Do not walk through spilled material. Wash thoroughly after handling.

#### Environmental precautions:

Prevent further leakage or spillage if safe to do so. Prevent from reaching drains, sewers and waterways. Discharge into the environment must be avoided.

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#### Methods and material for containment and cleaning up:

Do not touch damaged containers or spilled material unless wearing appropriate personal protective clothing. Stop leak if you can do it without risk. Contain and collect spillage and place in suitable container for future disposal. Dispose of in accordance with all applicable regulations (see Section 13).

#### Reference to other sections:

For personal protective equipment see Section 8. For disposal see Section 13.

### SECTION 7: Handling and storage

#### Precautions for safe handling:

Use appropriate personal protective equipment (see Section 8). Use only with adequate ventilation. Avoid breathing mist/vapor/spray/dust. Do not eat, drink, smoke, or use personal products when handling chemical substances. Avoid contact with skin, eyes and clothing. Wash affected areas thoroughly after handling. Keep away from incompatible materials (See Section 10). Keep containers tightly closed when not in use.

#### Conditions for safe storage, including any incompatibilities:

Store in cool, dry, well-ventilated location out of direct sunlight. Keep away from food and beverages. Protect from freezing and physical damage. Store away from heat, open flames and other sources of ignition. Keep container tightly sealed. Store away from incompatible materials (See Section 10).

#### Safe packaging material

##### Suitable material:

Not determined or not applicable.

##### Unsuitable material:

Not determined or not applicable.

### SECTION 8: Exposure controls and personal protection

Only those substances with limit values have been included below.

#### Occupational Exposure limit values:

No occupational exposure limits noted for the ingredient(s).

#### Biological limit values:

No biological exposure limits noted for the ingredient(s).

#### Information on monitoring procedures:

Not determined or not applicable.

#### Appropriate engineering controls:

Emergency eye wash stations and safety showers should be available in the immediate vicinity of use or handling. Provide adequate ventilation to maintain the airborne concentrations of vapor, mists, and/or dusts below the applicable workplace exposure limits, while observing recognized national standards (or equivalent).

#### Personal protection equipment

##### Eye and face protection:

Safety glasses or goggles. Use eye protection equipment that has been tested and approved by recognized national standards (or equivalent).

##### Skin and body protection:

Chemical resistant, impervious gloves approved by the appropriate standards. Gloves must be inspected prior to use. Avoid skin contact with used gloves. Appropriate techniques should be used to remove used gloves and contaminated clothing. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Ensure that all personal protective equipment is approved by recognized national standards (or equivalent).

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#### Respiratory protection:

If engineering controls do not maintain airborne concentrations below the applicable workplace exposure limits, or to an acceptable level (if exposure limits have not been established), a respirator approved by recognized national standards (or equivalent) must be worn.

#### General hygienic measures:

When handling chemical products, do not eat, drink or smoke. Wash hands after handling, before breaks, and at the end of the workday. Avoid contact with skin, eyes and clothing. Wash contaminated clothing before reuse. Perform routine housekeeping.

### SECTION 9: Physical and chemical properties

#### Information on basic physical and chemical properties

Physical State	Liquid
Color	Light Yellow
Odor	Characteristic acrylate
pH	Not determined or not available.
Melting point/freezing point	Not determined or not available.
Initial boiling point/range	> 100°C
Flash point (closed cup)	> 93.5°C
Evaporation rate	Not determined or not available.
Flammability (solid, gas)	Not flammable
Lower flammability/explosive limit	Not determined or not available.
Upper flammability/explosive limit	Not determined or not available.
Vapor pressure	Not determined or not available.
Relative density	Not determined or not available.
Relative gas density	Not determined or not available.
Density	1.07 g/cm <sup>3</sup>
Partition coefficient (n-octanol/water)	Not determined or not available.
Auto/Self-ignition temperature	Not determined or not available.
Decomposition temperature	Not determined or not available.
Kinematic viscosity	Not determined or not available.
Particle characteristics	Not determined or not available.
Solubilities	Not determined or not available.

#### Other information

Dynamic viscosity	2480 cps @ 25°C
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### SECTION 10: Stability and reactivity

#### Reactivity:

Not reactive under recommended handling and storage conditions.

#### Chemical stability:

Stable under recommended handling and storage conditions.

#### Possibility of hazardous reactions:

Hazardous reactions are not anticipated under recommended conditions of handling and storage.

Stable under recommended handling and storage conditions.

#### Conditions to avoid:

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Extreme heat, open flames, hot surfaces, sparks, ignition sources and incompatible materials.

Avoid storage >38°C (100°F) and exposure to light/direct sunlight and heat.

#### Incompatible materials:

Polymerization initiators, including peroxides, strong oxidizing agents, alcohols, copper, copper alloys, carbon steel, iron, rust, and strong bases.

#### Hazardous decomposition products:

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

### SECTION 11: Hazard information

#### Acute toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:** No data available.

#### Substance data:

Name	Route	Result
Acrylate Monomer(s)	oral	LD50 Rat: >2000 mg/kg
	dermal	LD50 Rat: >2000 mg/kg
Methacrylate Monomer(s)	oral	LD50 Rat: >=2000 mg/kg
	dermal	LD50 Rabbit: >5000 mg/kg
Photoinitiators	oral	LD50 Rat: >5000 mg/kg
	dermal	LD50 Rat: >=2000 mg/kg
Urethane dimethacrylate	oral	LD50 Rat: >5000 mg/kg
	dermal	LD50 Rat: >2000 mg/kg

#### Skin corrosion/irritation

##### Assessment:

Causes skin irritation.

##### Product data:

No data available.

**Substance data:** No data available.

#### Serious eye damage/irritation

##### Assessment:

Causes serious eye irritation.

##### Product data:

No data available.

##### Substance data:

Name	Result
Methacrylate Monomer(s)	Causes serious eye irritation.

#### Respiratory or skin sensitization

##### Assessment:

May cause an allergic skin reaction.

##### Product data:

No data available.

##### Substance data:

Name	Result
Acrylate Monomer(s)	May cause an allergic skin reaction.
Methacrylate Monomer(s)	May cause an allergic skin reaction.

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Name	Result
Photoinitiators	May cause an allergic skin reaction.
Urethane dimethacrylate	May cause an allergic skin reaction.

#### Carcinogenicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:** No data available.

**Substance data:** No data available.

#### International Agency for Research on Cancer (IARC):

Name	Classification
Methacrylate Monomer(s)	Not Applicable
Photoinitiators	Not Applicable
Urethane dimethacrylate	Not Applicable
Acrylate Monomer(s)	Not Applicable

**National Toxicology Program (NTP):** None of the ingredients are listed.

#### Germ cell mutagenicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

#### Reproductive toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

#### Specific target organ toxicity (single exposure)

**Assessment:**

May cause respiratory irritation.

**Product data:**

No data available.

**Substance data:**

Name	Result
Acrylate Monomer(s)	May cause respiratory irritation.

#### Specific target organ toxicity (repeated exposure)

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

#### Aspiration toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

#### Information on likely routes of exposure:

No data available.

#### Symptoms related to the physical, chemical and toxicological characteristics:

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No data available.

#### Other information:

No data available.

### SECTION 12: Ecological information

#### Acute (short-term) toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:** No data available.

#### Substance data:

Name	Result
Acrylate Monomer(s)	Fish LC50 Danio rerio: 1.65 mg/L (96 hr)
	Aquatic Invertebrates EC50 Daphnia magna: 2.36 mg/L (48 hr [mobility])
	Aquatic Plants ErC50 Raphidocelis subcapitata: 1.6 mg/L (72 hr [growth rate])
Methacrylate Monomer(s)	Aquatic Plants EC50 Pseudokirchneriella subcapitata: >97.2 mg/L (72 hr [growth rate])
	Fish LC50 Psetta maxima: 833 mg/L (96 hr)
	Aquatic Invertebrates EC50 Daphnia magna: >143 mg/L (48 hr [mobility])
Photoinitiators	Aquatic Plants EC50 Pseudokirchneriella subcapitata: >2.01 mg/L (72 hr [growth rate; read-across])
	Fish LC50 Danio rerio: 1 mg/L (96 hr [read-across])
	Aquatic Invertebrates EC50 Daphnia magna: 3.53 mg/L (48 hr [read-across])
Urethane dimethacrylate	Fish LC50 Danio rerio: 10.1 mg/L (96 hr)
	Aquatic Invertebrates EC50 Daphnia magna: > 1.2 mg/L (48 hr [mobility])
	Aquatic Plants EC50 Desmodesmus subspicatus: 0.68 mg/L (72 hr [growth rate])

#### Chronic (long-term) toxicity

#### Assessment:

Toxic to aquatic life with long lasting effects.

**Product data:** No data available.

**Substance data:** No data available.

#### Persistence and degradability

**Product data:** No data available.

#### Substance data:

Name	Result
Methacrylate Monomer(s)	The substance is readily biodegradable. 81% degradation in water, measured by BOD, after 28 days.
Photoinitiators	The substance is not readily biodegradable. <10 % degradation in water, measured by O2 consumption, after 28 days.
Urethane dimethacrylate	The substance is not readily biodegradable (22% degradation in 28 days).
Acrylate Monomer(s)	The substance is inherently biodegradable. 28% degradation in water, measured by O2 consumption, after 28 days.

#### Bioaccumulative potential

**Product data:** No data available.

#### Substance data:



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Name	Result
Methacrylate Monomer(s)	Low potential to bioaccumulate (BCF: 3.2; Log kow: 1.21)
Photoinitiators	The substance has a low potential for bioaccumulation based on a log Kow of 2.91.
Acrylate Monomer(s)	The substance is not expected to bioaccumulate (BCF: 6.17 L/kg, QSAR substance data).

#### Mobility in soil

**Product data:** No data available.

##### Substance data:

Name	Result
Methacrylate Monomer(s)	The substance has a low potential for adsorption to soil or sediments based on high water solubility, a low vapor pressure (0.11 hPa @ 20 deg C), and low log Kow (0.97).
Photoinitiators	Based on a log Koc of 3.37, adsorption to solid soil phase is expected.
Urethane dimethacrylate	The substance has moderate potential to adsorb to organic soil and sediment particles (log Koc: 3.66 dimensionless).
Acrylate Monomer(s)	The substance is slightly mobile, therefore, adsorption to soil and sediment is expected (log Koc: 3.61).

#### Results of PBT and vPvB assessment

##### Product data:

**PBT assessment:** This product does not contain any substances that are assessed to be a PBT..

**vPvB assessment:** This product does not contain any substances that are assessed to be a vPvB..

##### Substance data:

###### PBT assessment:

Acrylate Monomer(s)	The substance is not PBT.
Methacrylate Monomer(s)	The substance is not PBT.
Urethane dimethacrylate	This substance is not PBT.

###### vPvB assessment:

Acrylate Monomer(s)	The substance is not vPvB.
Methacrylate Monomer(s)	The substance is not vPvB.
Urethane dimethacrylate	This substance is not vPvB.

#### Hazard to the ozone layer

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:** No data available.

**Substance data:** No data available.

**Other adverse effects:** No data available.

### SECTION 13: Notes on disposal

#### Disposal methods:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory agencies. Dispose of in accordance with all applicable local, regional, state and federal regulations.

#### Contaminated packages:

Dispose contaminated packages in a safe manner in accordance with local and national regulations. Do not allow the product to be released into the environment.

### SECTION 14: Transport information

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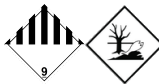
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#### International Carriage of Dangerous Goods by Road/Rail (ADR/RID)

UN number	UN 3082
UN proper shipping name	Environmentally hazardous substance, liquid, N.O.S. Urethane dimethacrylate
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None
Additional Information	This product is not regulated as a dangerous good when transported in sizes of ≤5L or ≤5 kg provided the packaging meets the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

#### International Maritime Dangerous Goods (IMDG)

UN number	UN 3082
UN proper shipping name	Environmentally hazardous substance, liquid, N.O.S. Urethane dimethacrylate
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None
Additional Information	This product is not regulated as a dangerous good when transported in sizes of ≤5L or ≤5 kg provided the packaging meets the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

#### International Air Transport Association Dangerous Goods Regulations (IATA-DGR)

UN number	UN 3082
UN proper shipping name	Environmentally hazardous substance, liquid, N.O.S. Urethane dimethacrylate
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None
Additional Information	This product is not regulated as a dangerous good when transported in sizes of ≤5L or 5≤ kg provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1 and 5.0.2.8.

#### Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Bulk Name	None
Ship type	None

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Pollution category	None
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## SECTION 15: Regulatory information

### Japan regulations

**Japan Inventory of Existing and New Chemical Substances (ENCS):** All ingredients are listed or exempt.

#### Chemical Substance Control Law

**Priority Assessment Chemical Substance:** None of the ingredients are listed.

#### Industrial Safety and Health Act (ISHA)

##### Existing Chemical Substances:

Trade Secret	Photoinitiators	Listed	4-(3)-117
72869-86-4	Urethane dimethacrylate	Listed	2-(5)-212
Trade Secret	Acrylate Monomer(s)	Listed	7-(2)-100, 7-(2)-0100

**Ordinance on Prevention of Organic Solvent Poisoning:** None of the ingredients are listed.

**PRTR Specified Class 1 Substances:** None of the ingredients are listed.

**PRTR Class 1 Substances:** None of the ingredients are listed.

**PRTR Class 2 Substances:** None of the ingredients are listed.

**Poisonous and Deleterious Substances:** None of the ingredients are listed.

#### Fire Service Law:

Trade Secret	Methacrylate Monomer(s)	Not Applicable
Trade Secret	Photoinitiators	Not Applicable
72869-86-4	Urethane dimethacrylate	Not Applicable
Trade Secret	Acrylate Monomer(s)	Not applicable.

**Additional information:** Not determined.

## SECTION 16: Other information

**Abbreviations and Acronyms:** None

#### Disclaimer:

This product has been classified in accordance with Japanese National Standard JIS Z 7252:2019, JIS Z 7253:2019 and the GHS Revision 6 guidelines. The information provided in this SDS is correct, to the best of our knowledge, based on information available. The information given is designed only as a guidance for safe handling, use, storage, transportation and disposal and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials, unless specified in the text. The responsibility to provide a safe workplace remains with the user.

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End of Safety Data Sheet